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ABSTRACT

The persistence of the freshman class (5,052 students) of 1974 at Indiana University's Bloomington campus was investigated. The students were classified into three groups according to their enrollment status in the fall of 1976. Two-thirds were persisters who were enrolled for their third academic year. Among the students who were no longer enrolled were the dropouts who were in academic difficulty when they left the University and the nonacademic dropouts who left for reasons other than academic difficulty. Approximately 14 percent of the 1974 class were academic dropouts and 18.5 percent were nonacademic dropouts. The three groups were compared on selected academic and biographic variables. The relationship of these variables to students' first semester grades, cumulative hours at the University, and enrollment status is also investigated. The importance of the retention of students to the vitality of an institution is emphasized. It is suggested that an understanding of the persistence/attrition phenomenon is necessary if an institution is to develop programs that facilitate the goal of a college education for each entering student. (Author/SF)

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Persistence/Attrition: A Longitudinal Study of the Freshman Class of 1974

INDIANA STUDIES IN HIGHER EDUCATION

Number Forty-One

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INDIANA UNIVERSITY 1979

PERSISTENCE/ATTRITION:
A LONGITUDINAL STUDY OF THE FRESHMAN CLASS OF 1974

S. LEELLEN BRIGMAN
LUCY CHESER JACOBS

INDIANA STUDIES IN HIGHER EDUCATION
NUMBER FORTY-ONE

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Abstract

This study investigated the persistence of the freshman class at Indiana University's Bloomington campus. These students were classified into three groups according to their enrollment status in the fall of 1976. Two-thirds (67.2%) were persisters who were enrolled for their third academic year. Among the students who were no longer enrolled were the dropouts who were in academic difficulty when they left the University and the nonacademic dropouts who left for reasons other than academic difficulty. Approximately 14% of the 1974 class were academic dropouts and 18.5% were nonacademic dropouts.

The three groups were compared on selected academic and biographic variables. The relationship of these variables to students' first semester grades, cumulative hours at the University, and enrollment status was investigated.

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Introduction

College attrition is not a new phenomenon; it is a continuing problem facing higher education. In the decade of the 60's, more than 10 million students entered institutions of higher education. The overwhelming majority had expectations of earning a college degree. Fewer than half of these students earned a degree within the scheduled period of time. Focusing on four year colleges and universities, Panos & Astin (1968) found that approximately 65 percent of the men and women who entered these institutions had completed a baccalaureate degree in the four year specified period. Based on these trends, it is expected that of the 15 million students who are to enter colleges in the 1970's, one-half will earn a degree on schedule and approximately one-third (five to six million) will never graduate. In a study of the persistence of students at Indiana University-Bloomington (I.U.B.), it was found that approximately 60 percent of the freshmen who entered I.U.B. in the Fall 1971 were still enrolled in the I.U. system at the end of four years. (Chase, Dalton, Johnson & Anastasiow, 1976)

Although the rate of attrition has remained surprisingly constant for the last four decades, understanding of the attrition phenomenon is becoming crucially important with the declining enrollments projected for the future in higher education. Identifying the causes of college attrition has proved to be a very complex task. Historically it has been assumed that academic failure was the major cause of attrition among college students. Many of the studies in this field have not differentiated between students who were having academic problems at the time of withdrawal and those students who were performing adequately at the time of withdrawal. Summerskill's 1962 study revealed that only about one-third of college dropouts were in academic difficulty when they left their institutions. A national survey found that for almost every institution included in the survey, the majority of withdrawing students were doing satisfactory academic work at the time of withdrawal (Chickering and Hannah, 1969). Today any study of college attrition must differentiate between those dropouts who are compelled to leave because of poor grades (academic dropouts, ADs) and the voluntary withdrawals who are not in academic difficulty (nonacademic dropouts, NADs).

The purpose of this study was to extensively examine attrition in the first two years at I.U.B. with a focus on achieving a better understanding of this phenomenon. The study was limited to the first two years at I.U. since it has been found that the greatest percentage of attrition occurs during this period (Cope and Hannah, 1975). Also, this study was restricted to student information available in University computer files. For this reason only biographic and academic measures were investigated. Even with these limitations, it is hoped that this study may provide a better understanding and awareness of the attrition phenomenon at I.U.B. and thus indicate possible avenues of action for the University that might increase the retention probability of the I.U. student.

Design of the Study

The 5052 students who enrolled for the first time in college in the Fall 1974 at I.U.B. provided the data base for this study. Information on a number of academic and biographic variables was retrieved from the student data files. The academic variables included in the study were (1) rank in high school graduation class, (2) size of high school graduation class, (3) Scholastic Aptitude Test, Verbal Score, (4) Scholastic Aptitude Test, Mathematics Score, (5) first semester grade point average at I.U.B., (6) cumulative grade point average, (7) cumulative hours, (8) academic major during the last semester and (9) class standing. The biographic variables included in the study are (1) sex, (2) state of residence, (3) county of residence (if Indiana resident), (4) race, (5) parental alumni status, (6) date the application for admission to I.U.B. was approved, and (7) last semester in attendance at any campus of I.U.

The classification of a student as a dropout presents a major problem in all studies of attrition. The temporariness of a definition of dropouts is explicit when one recognizes that any former student can go back to college to complete a degree at any time in his/her life. Astin (1975) has stated that, "No categorization will be wholly satisfactory until all students either obtain their degrees or die without receiving them." The present study dealt with this problem by employing the last semester attended (LSA), cumulative hours (CUM HRS) and cumulative grade point average (CUM GPA) to classify students into three groups according to their enrollment status in Fall 1976. For this study, persisters (PERs) were defined as students who enrolled at any campus of I.U. for Fall Semester 1976. Dropouts comprised the other two groups. The academic dropouts (ADs) were students who did not enroll at any campus of I.U. in Fall 1976 and had a CUM GPA less than 1.90 if a freshman or a CUM GPA less than 2.00 if an upperclassman when they last attended I.U. Whether or not these students were technically suspended, they were in academic difficulty the last semester they attended I.U. The second group of students no longer enrolled at I.U. were those who were <u>not</u> in academic difficulty (NADs) the last semester they attended. Specifically, NADs consisted of those students who did not enroll at any campus of I.U. in Fall 1976 and whose CUM GPA when they last attended was not sufficiently low to be classified an academic dropout, i.e., a CUM GPA of 1.90 or higher as a freshman or a CUM GPA of 2.00 or higher as an upperclassman. The NADs were considered to be voluntary withdrawals. No attempt was made to identify students who transferred to other schools outside the I.U. system.

The present study was divided into three parts. The purpose of the first part was to provide descriptive information on students' enrollment status at the beginning of their third academic year at I.U. The second part of the study focused on the relationship of the status of the

student at the time of admission to the enrollment status at the beginning of the third academic year. The last part of the study focused on the relationship of academic and biographic variables to first semester grades and the cumulative hours at the beginning of the third academic year. The number of credit hours accrued at I.U. was considered as a measure of academic persistence.

Descriptive Study of Enrollment Status

At the beginning of the third academic year (Fall 1976), the students were divided into three groups according to their enrollment status. Of the 5052 students who entered I.U.B. in Fall 1974, 718 students (14.2%) were classified as academic dropouts (ADs), 937 students (18.5%) were classified as non-academic dropouts (NADs), and 3397 students (67.2%) were classified as persisters (PERs) at I.U. Table 1 provides information as to the composition of each group on the available biographic variables.

Examining the information in Table 1, one finds that the three groups, ADs, NADs and PERs, were significantly different on the variables of sex, race, state of residence, county of residence, and parents' alumni status*. The major difference was between ADs and the other two groups. When compared with NADs, a higher percentage of ADs were males, and a higher percentage were foreign students or students who did not report information on race, on state of residence, or on parents' alumni status. A lower percentage of ADs and a higher percentage of NADs were either from out of state or did not report information on county of residence. Also, a higher percentage of females were NADs thar would be expected in the population.

An interesting finding illustrated in Table 1 was that the out-of-state students were more likely to withdraw from Indiana University for nonacademic than for academic reasons. Thirty-three (33) percent of the NADs were out-of-state residents while 24.4 percent of the ADs and 23.9 percent of the PERs were from outside of Indiana. On the other hand, a higher percentage of Indiana residents were found among ADs and PERs. Among the Indiana residents, the students from the major industrial counties were more often classified as ADs or PERs than classified as NADs.

Directly related to these findings were the class standings of the groups during the last semester in attendance at I.U. It was found that 68.7 percent of the ADs classified themselves as freshmen and 55.9 percent of the NADs reported themselves to be sophomores their last semester. In Fall 1976, 75 percent of the PERs reported their status as junior.

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*Chi Square tests were performed on the frequencies of ADs, NADs, and PERs for each variable in Table 1 with the exception of the variable of last semester attended.

Table 1

Percentages of Academic Dropouts (ADs), Nonacademic Dropouts (NADs) and Persisters (PERs) for each Category

Biographic Variable Categories	ADs N=718	NADs N=937	PERs N=3397	Total N=5052
Sex				
Male	63.6*	41.6	48.3	49.2←
Female	36.4	58.4	51.7	50.8
Race				
Black	4.2	1.3	2.7	2.6
Caucasian	75.1	87.4	89.8	87.3
Am. Indian	0.3	0.2	0.1	0.2
Mexican/Span. Surname Am.	0.8	0.4	0.2	0.3
Oriental American	0.3	0.3	0.5	0.5
Other[a]	19.3	10.4	6.7	9.2←
State of Residence				
Indiana	75.6	66.9	76.1	74.3
Contiguous States[b]	3.2	11.7	9.8	9.2
Other States	3.1	12.5	8.5	8.5
Other[a]	18.1*	8.9	5.6	8.0←
County of Residence				
Major Industrial	33.4	29.5	37.1	35.2
Metropolitan	20.3	16.6	16.8	17.3
Non-Metropolitan	22.4	20.7	22.7	22.3
Other[c]	23.8	33.2*	23.4	25.3←
Parents' Alumni Status				
Both Parents	2.9	4.2	5.2	4.7
Father only	7.5	6.9	9.2	8.5
Mother only	2.1	3.3	3.0	2.9
Neither Parent	69.4	76.6	77.0	75.8
Other[d]	18.1*	9.0	5.7	8.1←
Last I.U. Campus Attended				
Bloomington	91.2	90.4	88.2	89.1
Other Campuses	8.8	9.6	11.8	10.9
Last Semester Attended				
Fall 1974	30.5*	8.9	-	6.0←
Spring	27.4	29.9	-	9.4
Summer	0.8	0.9	-	0.3
Fall 1975	16.3	17.3	-	5.5
Spring	23.0	38.4	-	10.4
Summer	1.9	4.7	-	1.1
Fall 1976	-	-	100.0	67.2

[a]Includes foreign students and students who did not respond.
[b]Includes students from Ohio, Kentucky, Illinois and Michigan.
[c]Non-Indiana resident and blank data.
[d]Blank data.
←Category in which the greatest discrepancy was observed between the actual frequencies and the expected frequencies.
*Single group in which the greatest discrepancy was observed between actual frequencies and expected frequency.

For the two groups of dropouts, ADs and NADs, the information on last semester attended (LSA) was examined. There was a significant difference in ADs and NADs as to the LSA. The most significant difference between the groups on this variable was for Fall Semester when a significantly higher percentage of the ADs left the University. Data in Table 1 supported earlier findings that the highest rate of attrition due to academic problems occurred during the first year at the University. Fifty-nine percent of the academic dropouts left the University during the first year. The dropout rate for the first semester was slightly higher than for the second semester. In contrast, the highest rate of attrition for nonacademic reasons occurred during the second year at the University. Table 1 shows that 60.4 percent of the nonacademic dropouts left during their second year. The Spring semester of the second year claimed the greatest number of these students.

The academic variables included in the present study provided additional information on the differences in the three groups of students. Table 2 shows the means and standard deviations for each of the three groups on six academic variables.

Statistical tests* were run on each of the academic variables in Table 2 to determine if the three groups were significantly different. It was found that ADs and NADs were from high schools with significantly smaller graduation classes than were the PERs. Each group, ADs, NADs and PERs, was significantly different from the others on relative high school rank and on cumulative GPA at I.U. The ADs were lowest of the three groups on both measures with the PERs highest on both measures. The ADs were also significantly lower than the NADs and PERs on Scholastic Aptitude Test, Verbal Score (SAT-V), Scholastic Aptitude Test, Mathematics Score (SAT-M), and Fall 1974 GPA. The NADs and PERs did not differ significantly on these last three variables.

The significant difference on the variable CUM GPA is noteworthy. Although the persisters and NADs were similar on the academic aptitude test scores and on Fall 1974 GPA, they differed significantly on cumulative GPA by the end of the second year. Perhaps the decline in achievement on the part of the NADs reflected the presence of problems or their growing disenchantment with the University which finally resulted in their withdrawal.

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*One way analyses of variance were performed with a significance level set at .01.

Table 2

Means and Standard Deviations
on Six Academic Variables for Academic Dropouts (ADs),
Nonacademic Dropouts (NADs), and Persisters (PERs)

Statistic	ADs	NADs	PERs	Total
Size of High School Graduation Class				
Mean	371	378	415	402
Standard Deviation	250	249	275	268
Number of Students	640	876	3158	4674
Relative Rank in High School Graduation Class[a]				
Mean	45	26	24	28
Standard Deviation	23	20	20	22
Number of Students	640	876	3158	4674
Scholastic Aptitude Test-Verbal				
Mean	420	475	479	471
Standard Deviation	92	97	94	96
Number of Students	608	855	3207	4670
Scholastic Aptitude Test-Mathematics				
Mean	455	509	519	509
Standard Deviation	100	100	99	101
Number of Students	608	855	3207	4670
Fall 1974 Grade Point Average (GPA)				
Mean	1.30	2.86	2.92	2.68
Standard Deviation	0.91	0.65	0.71	0.92
Number of Students	718	937	3397	5052
Cumulative GPA Obtained at I.U.				
Mean	1.12	2.82	2.90	2.63
Standard Deviation	0.70	0.54	0.60	0.86
Number of Students	718	937	3397	5052

[a]Relative Rank is an I.U. admissions variable which is obtained by dividing a student rank in the high school graduation class (HSRank) by size of the high school graduation class and multiplying the results by 100.

Overview of the Descriptive Study

Of the 5052 freshmen who entered Indiana University's Bloomington campus in the Fall of 1974, the majority could be characterized as:

1) Caucasian,
2) residents of Indiana,
3) residents of major industrial counties, and
4) students whose parents were not graduates of I.U.

At the beginning of the third academic year, 67.2% of the students were enrolled at a campus of I.U. The typical persister:

1) was from a high school with a significantly larger graduation class,
2) ranked significantly higher in his/her high school graduation class, and
3) had obtained a significantly higher GPA by the beginning of the third academic year at I.U. than the student who was no longer enrolled at I.U.

Of the students who were not enrolled at I.U. at the beginning of the third academic year, the majority (56.6%) were not in academic difficulty the last semester they attended I.U. The nonacademic dropouts:

1) were predominantly females,
2) were comprised of a disproportionally large percentage of students from outside of Indiana (out-of-state residents),
3) exited the University during their second academic year, and
4) ranked significantly higher in his/her high school graduation class and had obtained a significantly higher GPA when he/she left the University than the dropout who had left the University in academic difficulty.

Of the students who were not enrolled at I.U. in the Fall of 1976 the minority (43.4%) were in academic difficulty the last semester they attended I.U. The academic dropouts:

1) were predominantly males,
2) were comprised of a higher than average percentage of students from Indiana,
3) exited the University during their first year at I.U.,
4) did not provide biographic information on their computer files,
5) ranked significantly lower in his/her high school graduation class,
6) scored significantly lower on the Verbal and Mathematics sections of the Scholastic Aptitude Test, and
7) were significantly lower on their first semester GPAs and cumulative GPAs than their peers who entered I.U.B. in the Fall of 1974.

Relationship of Enrollment Status to Admission Files

An indication of a student's advanced planning and personal commitment to obtaining a college education may be reflected in how early he or she applies to a college prior to matriculation and how thoroughly all admission procedures are completed. This section of the study examined two questions:

> Is there any relationship between the amount of data available on a student's admissions file and his/her enrollment status at the beginning of the third academic year?
>
> Is there any relationship between the time a student's application is accepted by the University and the student's enrollment status at the beginning of the third academic year?

Each entering student's computerized admissions file was checked for the availability of Scholastic Aptitude Tests (SAT) scores and high school data, i.e., size and rank in the high school graduation class. SAT and high school data are used to predict college grades, and thus are criteria for admission to the University. Table 3 presents the information on the availability of the admission criteria according to enrollment status at the beginning of the third academic year.

Table 3

Number of Students According to Enrollment Status and Availability of Admission Criteria

Admission Criteria	ADs	NADs	PERs	Total
Neither High School nor SAT	47 (+25)[a]	29 (0)	80 (-25)	156
High School only	63 (+31)	53 (+11)	110 (-42)	226
SAT only	31 (-1)	32 (-9)	159 (+10)	222
Both High School and SAT	577 (-55)	823 (-2)	3048 (+57)	4448

[a]Numbers in parentheses are the differences between the actual number of students in a category and the statistically expected number of students in that category based on the percentage in the enrollment status and the total number in the Admission Criteria group. These values indicate the over-representation (+'s) or the under-representation (-'s) of the enrollment status in that category.

An analysis of the information in Table 3 indicated that the three enrollment status groups differed significantly in the number of admission criteria available on the students' computerized admission files.* By comparing the actual number of students to the statistically expected number of students for each group in the table, it was found that there was an over-representation of ADs among those students who were missing both high school and SAT data. Also, there was the over-representation of ADs among those students who had no SAT scores on their admission files; only their high school data were available. This particular combination of admission criteria available in a student's file was also observed for the NADs. On the other hand, more of the PERs than would be statistically expected had both SAT and high school data available in their admission files.

To examine the relationship of date of admission to enrollment status, ADs and NADs were divided into first and second year dropouts. The date of admission to the University is classified according to month and year that the application for admission was accepted by the University. Table 4 presents the enrollment status of students at the University classified according to their date of admission. The actual number of students in each group is shown in the table along with the difference between the actual number and the number that would be statistically expected in that category.

An analysis* of the data in Table 4 indicated that there was a significant relationship between the date of admission to the University and the enrollment status of students at the beginning of the third academic year. Students who were admitted to the University at an early date were less likely to be among the students dropping out of the University, i.e., they tended to be PERs.

The relationship of date of admission to enrollment status was most prominent when the data for ADs were examined. The two columns of data for academic dropouts indicate that among students admitted after March there was a consistent trend for the actual number of academic dropouts to exceed the number that would be statistically expected based on their representation in the total population. In other words, ADs were over-represented among the late admissions to the University. There was a reverse of this trend when one examined the academic dropouts who were admitted to the University before March; there was an under-representation of ADs among the early admission students. This relationship was further illustrated by comparing the percent of academic dropouts among early and late admissions to the University. A total of 1853 students were admitted to the University in March or later. Four hundred fifty-eight (458) or 24.7

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*Chi Square test was performed with a significance level set at .01.

Table 4

Number of Students According to Enrollment Status and Date of Admission to the University

Date of Admission	ADs 1st Yr.	ADs 2nd Yr.	NADs 1st Yr.	NADs 2nd Yr.	PERs	Total
August 1974	75 (+53)[a]	35 (+20)	20 (+1)	21 (-8)	107 (-66)	258
July 1974	60 (+39)	28 (+13)	26 (+7)	26 (-2)	112 (-57)	252
June 1974	43 (+23)	24 (+10)	15 (-2)	33 (+7)	119 (-38)	234
May 1974	47 (+19)	26 (+6)	29 (+4)	47 (+9)	191 (-38)	340
April 1974	19 (-13)	31 (+9)	31 (+3)	47 (+5)	251 (-4)	379
March 1974	40 (+7)	30 (+7)	38 (+9)	44 (0)	238 (-24)	390
Feb. 1974	39 (-15)	32 (-6)	52 (+4)	71 (-2)	456 (+19)	650
Jan. 1974	33 (-24)	33 (-9)	46 (-7)	90 (+10)	516 (+33)	718
Oct.-Dec.[b] 1973	60 (-80)	55 (-43)	99 (-24)	172 (-16)	1292 (+164)	1678
Before Oct. 1973	6 (-7)	2 (-7)	15 (+4)	15 (-2)	115 (+12)	153
Total	422	296	371	566	3397	5052

[a]Numbers in parentheses are the differences between the actual number of students in a category and the statistically expected number of students in that category based on the percentage in the enrollment status and the total number in the Date of Admission group. These values indicate the over-representation (+'s) or the under-representation (-'s) of the enrollment status in that category.

[b]Records combined for October, November and December admission into one category.

percent of these became academic dropouts. Of the 3199 students admitted before March, 260 or only 8.1 percent became academic dropouts. Sixty-five (65) percent of the first year academic dropouts and fifty-nine (59) percent of the second year academic dropouts were among those admitted in March or later. The number of nonacademic dropouts classified according to the date of admission indicated a similar but not significant trend.

An examination of the data for persisters indicates that for the students admitted in March or later, there was an under-representation of persisters based on their representation in the population. Of the 1853 students admitted in March or later, 54.9 percent were persisters; of the 3199 students admitted before March, 74.3 percent were persisters. Thus a higher percentage of the persisters were among the early admissions to the University.

In the interpolation of the data, it was found that one-half of the PERs were admitted to the University before January 18. In contrast, one-half of the first year and second year ADs were admitted after May 9 and March 27 respectively. For the first and second year NADs, fifty percent were admitted after Feb. 14 and Feb. 2 respectively.

Overview of the Admission Data Study

An examination of the admission files of students who entered Indiana University's Bloomington campus in Fall 1974 showed a definite relationship of incomplete admission data and the date of admission to enrollment status at the beginning of the third academic year. It was found that:

1) academic dropouts were more likely not to have Scholastic Aptitude Test scores or high school data on their admission files,
2) nonacademic dropouts tended not to have Scholastic Aptitude Test scores on their admission files,
3) persisters had both Scholastic Aptitude Test scores and high school data on their admission files,
4) academic dropouts were "late admits" to the University when compared to the persisters,
5) nonacademic dropouts were applying a little later than the persisters but the trend for the nonacademics to be late admits was not consistent or significant, and
6) persisters were admitted to the University significantly earlier than their peers who academically dropped out and slightly earlier than their peers who were not in academic difficulty when they left the University.

Relationship of Aptitude and Biographic Variables to Academic Performance and Persistence

Most institutions of higher learning have employed selection systems to identify from among a large number of applicants those who were most likely to succeed academically at their institution. These selection systems have resulted from systematic investigations of the relationship of relevant measures to success at the institution. Indiana University has used the traditional academic measures of high school performance (relative rank) and aptitude test scores (total score on the SAT) to predict an applicant's first semester academic performance (grade point average).

The purpose of this study - the third phase of the broader investigation - was to explore the relationship of traditional and non-traditional measures to academic performance and persistence. First semester grade point average was used as the measure of academic performance. Incorporated in the concept of persistence are factors of the student's long range academic success, motivation, tenacity, etc. In the previous sections persistence has been quantified as the number of semesters a student attended I.U. within two academic years of matriculation. An alternative method of quantifying persistence is found in the cumulative hours of credit received at I.U. within this same time period. This part of the study employed the latter definition of persistence.

Specifically, this part of the study examined the following questions:

1. What was the relationship between admissions measures and first semester grade point averages?
   - A. What was the maximum relationship of first semester grades with the combination of traditional and non-traditional measures?
   - B. Which measures accounted for a significant amount of variance in first semester grades?
2. What was the relationship between admissions measures and cumulative hours at the end of two academic years?
   - A. What was the maximum relationship of cumulative hours with the combination of traditional and non-traditional measures?
   - B. Which measures were significantly related to cumulative hours?
   - C. After one semester at I.U.B., what was the maximum relationship of the combination of traditional and non-traditional measures and first semester grades with cumulative hours?

From the University's admission files the following measures were obtained: 1) relative rank in high school,

2) SATV, 3) SATM, 4) residence status, 5) parent alumni status, 6) date of admission to I.U.B. (Addate), 7) size of high school graduation class and 8) race.

It was expected that there would be differential relationships for males and females; thus, all analyses were performed separately for men and women. Because of the extent of missing information on student admission files and because of the relationship of the missing data to academic dropouts, several methodological modifications were required to perform this phase of the study. For a more technical description of the methodology used in this part, see Appendix. Four analyses were performed for each sex: 1) relationship of the traditional academic measures (SATV, SATM, and relative rank) to Fall 1974 grade point average (GPA174); 2) relationship of the eight traditional and non-traditional admission measures to GPA174; 3) relationship of the eight admission measures to cumulative hours and 4) relationship of first semester grades and the eight admission measures to cumulative hours.

In interpreting each analysis, emphasis was placed on the measures which were significantly related to the criterion of first semester grades or cumulative hours. The measures were ranked and listed in the accompanying tables from the most significant measure to the least significant measure. Any measure omitted in the accompanying tables did not significantly add to the multiple relationship with the criterion. The multiple correlation represents the relationship between the criterion and the combination of significant measures. These two indices were used to determine how accurately the performance or persistence could be accounted for with the combination of the significant measures. These indices range from 0.00 to 1.00 with the ideal of 1.00 being a perfect accounting of the performance or persistence of students. The unstandardized regression weights associated with each measure were used to indicate the change in the criterion for a unit change in a measure when all other significant measures for individuals were equal.

The first analyses dealt with the relationship of the traditional academic measures of relative rank, SATV and SATM to first semester grade point average (GPA174). Table 5 presents the results for men. Two of the three measures, relative rank and SATV, were significantly related to first semester grades. Relative rank was more significantly related to grades than was SATV. The regression weight (B) for relative rank has a negative (-) sign. Relative rank is expressed on a scale of 1 to 100 such that a relative rank of 1 indicates that the student was in the top one percent of the high school graduation class, 5 indicates that a student was in the top 5 percent of the high school graduation class, etc. The negative regression weight means that as the relative rank dropped from 1 to 100, the first semester grades increased from 0 to 4.00. In more general terms, the negative sign indicates that as the numerical value associated with one measure increases, the

numerical value associated with a second measure decreases. Based on the regression weight, it was interpreted that for each 15 percent difference in relative rank, there was an average difference of .20 grade points* If two students were equal in relative rank, there was a .20 difference in first semester grade point average for every 100 points difference on the SATV. The multiple correlation of .491 in Table 5 indicated that 24 percent of the variability in first semester grades of males was accounted for by relative rank and SATV.

Table 5

Relationship of Traditional Measures to First Semester Grades of Males

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
Relative Rank	-.013	.462	
SATV	.002	.491	.78

Table 6

Relationship of Traditional Measures to First Semester Grades of Females

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
SATM	.002	.491	
Relative Rank	-.012	.561	
SATV	.001	.578	.63

*The coefficient of multiple correlation, R, represents the relationship between a combination of independent variables and a dependent or criterion variable. The square of R or R^2 represents the percent of variance in the criterion that can be accounted for by the independent variable in combination.

Table 6 presents the results of the analysis of the relationship of the traditional academic measures to first semester grades for females. All three measures were significantly related to their first semester grades. SATM showed the highest relationship; for each 100 points on the mathematics section of the SAT there was a difference of .20 in the grade point average. Also a .20 difference in grade point average was associated with a 17 percent difference in relative rank or 200 points difference on the SATV.

*For purposes of interpretation, a .20 difference in the grade point average was chosen as a sufficient difference to be associated with a change in the significant measure.

The combination of these three measures accounted for 33 percent of the variability in first semester grades of females.

The second analysis examined the relationship of the eight admission measures to first semester grades. Table 7 presents the results of this analysis for males. Only two measures of the eight (relative rank and SATV) were significantly related to first semester grades. Again relative rank was the measure having the highest relationship with the grades of males followed by SATV. The lack of any additional significant measures indicated that the other six measures did not make a significant contribution to the prediction of first semester grades. The multiple correlation in Table 7 is the same as in Table 5. In other words, no additional variability in first semester grades of males could be accounted for with the eight measures beyond that which was accounted for by the traditional measures alone, i.e., 24 percent of the variance.

Table 7

Relationship of Admission Measures to First Semester Grades of Males

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
Relative Rank	-.013	.462	
SATV	.002	.491	.78

Table 8

Relationship of Admission Measures to First Semester Grades for Females

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
SATM	.002	.491	
Relative Rank	-.011	.561	
SATV	.002	.578	
Addate	.030	.585	.63

*The coefficient of multiple correlation, R, represents the relationship between a combination of independent variables and a dependent or criterion variable. The square of R or R^2 represents the percent of variance in the criterion that can be accounted for by the independent variable in combination.

Table 8 presents the results of the second analysis for females. As in the first analysis for females, SATM, relative rank, and SATV were significantly related to first semester grades. Only one of the additional measures, ADDATE,

was found to be significantly related to the academic performance of females. ADDATE, defined as the number of months between admission and matriculation at I.U., accounted for a significant amount of the variability in first semester grades. For females who were equal on the three traditional measures, the earlier admitted student would have a higher grade point average. An interpretation of the data in Table 8 indicated that for each 6 and 2/3 months difference in ADDATE, an average of .20 difference in grade point average would be expected. With the addition of ADDATE, 34 percent of the variability in first semester grades could be accounted for among female freshmen at I.U.B.

The next two analyses focused on the criterion of cumulative hours of credit in two years at the University as a measure of persistence. These analyses attempted to determine at two points in time - admission and after one semester - which of the available measures were significantly related to persistence.

Table 9 presents the analysis results of the relationship of the eight admission measures to persistence of males at I.U.B. Of the eight measures available at the time of admission, relative rank has the highest relationship to hours of credit accumulated in a two year period. For each 16 percent increase in the rank in the high school graduation class, a male averaged three more hours of credit at the end of two years*. Three other measures were significantly related to persistence: residence status, addate, and race. A male student from Indiana had an average of six credit hours more than his counterpart who was from outside the state of Indiana. On the average, for each three months in advance of matriculation that a student was admitted to I.U., he accumulated three more hours of credit. Finally, the data in Table 9 indicate that if two males were equal on the first three measures, the minority male acquired an average of 10.3 more hours of credit in two years than his Caucasian counterpart. The four significant measures accounted for only 14 percent of the variability in the cumulative hours of males. It was of interest that neither SATV nor SATM was significantly related to the accumulated hours of credit.

The admission measures that were significantly related to the persistence of females at the University are presented in Table 10. As with the case with males, the relative rank in the high school class was the measure having the highest relationship to the cumulative hours of credit within two years of admission. On the average, for each 15 percent higher rank in the high school graduation class, a female accumulated three more hours of credit in the two

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*For the purpose of interpretation, a 3 credit hour difference in two years was chosen as a sufficient difference to be associated with change in the significant measure.

year period. The measure having the next highest relationship with persistence was addate. For each 2 and 1/3 months between the admission and matriculation, a female averaged three more hours of credit. The last two measures significantly related to the persistence of females were SATV and residence status. If a female scored 150 points higher on the verbal section of the SAT than a counterpart, she averaged three more hours of credit; if she was from Indiana she averaged 5.4 more hours than her out-of-state counterpart. Information on these four admission measures accounted for 19 percent of the variability in the cumulative hours of females.

Table 9

Relationship of Admission Measures to Cumulative Hours for Males

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
Relative Rank	-.19	.313	
Residence Status	6.24	.342	
Addate	.98	.357	
Race	-10.31	.373	17.0

Table 10

Relationship of Admission Measures to Cumulative Hours for Females

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
Relative Rank	-.20	.346	
Addate	1.31	.402	
SATV	.02	.418	
Residence Status	5.37	.433	14.3

*The coefficient of multiple correlation, R, represents the relationship between a combination of independent variables and a dependent or criterion variable. The square of R or R^2 represents the percent of variance in the criterion that can be accounted for by the independent variable in combination.

The last analysis examined the relationship of the combination of admission measures and first semester grades to persistence. The results of this analysis for males are in Table 11. First semester grades (GPA174) had the highest relationship to the persistence of males at the University. An interpretation of the data in Table 11 indicated that for each .26 difference in grade point average there was a

difference of three hours of credit after two years. Three other measures were significantly related to the persistence of males: residence status, race, and addate. A male from Indiana averaged 5.7 more hours of credit than his out-of-state counterpart with an equivalent first semester grade-point average. When two males were equal on the preceding measures, the minority male averaged 11 more hours of credit in two years. Finally, for the male who was admitted to the University 4 and 1/3 months earlier than his counterpart, the "early admit" averaged three more hours of credit. A comparison of Tables 9 and 11 indicated that there was a substantial increase in the index of relationship (multiple correlation) from .373 to .616 when first semester grades were added to the admission measures. Thus, the combination of GPA174 and admission measures accounted for 38 percent of the variability in cumulative hours for males.

Table 11

Relationship of First Semester Grades and Admission Measures to Cumulative Hours for Males

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
GPA174	11.42	.588	
Residence Status	5.74	.601	
Race	-11.05	.609	
Addate	.70	.616	14.4

Table 12

Relationship of First Semester Grades and Admission Measures to Cumulative Hours for Females

Significant Variables	Regression Weight	Multiple Correlation*	Standard Error
GPA174	5.88	.406	
Addate	1.09	.449	
Relrank	-.14	.470	
Residence Status	5.12	.482	13.9

*The coefficient of multiple correlation, R, represents the relationship between a combination of independent variables and a dependent or criterion variable. The square of R or R^2 represents the percent of variance in the criterion that can be accounted for by the independent variable in combination.

Table 12 presents the results of the analysis of persistence for females when first semester grades were added

to the admission measures. Four measures were significantly related to the number of hours accumulated in two years by female students. Again, first semester grades showed the highest relationship with persistence. However, this relationship between first semester grades and persistence was not as high for the females as for the males. On the average, for each .50 difference in grade points there were three more hours of credit in two years.

Addate appeared as the second significant measure related to persistence of females. For each 3 months between admission and matriculation, a female averaged three additional hours of credit. Relative rank continued to be a significant factor in the persistence of females; for each 21 percent difference in rank, a female averaged three more hours of credit. Finally, it was found that if two females were equivalent on the first three measures, a female from Indiana averaged five hours of credit more than her out-of-state counterpart. The combination of first semester grades and the admission measures accounted for 23 percent of the variability in the cumulative hours of females at I.U.

Overview of the Studies of Relationships

The study of the relationship of the three traditional measures of academic ability - verbal and mathematics scores on the Scholastic Aptitude Test and relative rank in the high school graduation class - to first semester grades found:

1) for males, relative rank in the high school graduation class was the measure most significantly related to first semester grades.
2) for males, the mathematics section of the Scholastic Aptitude Test was not significantly related to first semester grades.
3) for females, the mathematics section of the Scholastic Aptitude Test was the measure most significantly related to first semester grades, and
4) the combination of the three traditional measures were related more significantly to first semester grades of females than to first semester grades of males.

The study of the relationship of the eight admission measures to the first semester grades found:

1) for males only the two traditional measures -- relative rank in the high school graduation class and the verbal score on the Scholastic Aptitude Test -- were significantly related to first semester grades, and
2) for females the mathematics scores on the Scholastic Aptitude Test, the relative rank in the high school graduation class, the verbal score on the Scholastic Aptitude Test and the date of admission were significantly related to first semester grades.

The study of the relationship of the eight admission measures to persistence - cumulative hours obtained in the first two academic years at I.U. - found that:

1) three measures -- relative high school rank, residence status, and date of admission -- were significantly related to the persistence of males and females,
2) for females one additional measure -- verbal score on the Scholastic Aptitude Test -- was also significantly related to their persistence at I.U.,
3) for males one additional measure -- race -- was significantly related to their persistence at I.U., and
4) only 14 and 19 percent of the variability in cumulative hours could be accounted for among the males and females respectively.

The study of the relationship of first semester grades and the eight admission measures to the persistence of students at I.U. found:

1) first semester grade point average was the measure most significantly related to the persistence of males and females,
2) residence status and date of admission were significantly related to the persistence of both the males and females,
3) relative rank in high school for females and race for males were significantly related to the persistence at I.U., and
4) the combination of the first semester grades and the admission measures were related more significantly to the persistence of males than to the persistence of females at I.U.

Summary

The national attrition rates in higher education have been under constant study for several decades (Iffert, 1957; Eckland, 1964; Statistical Abstracts, 1974; Fetters, 1977). The results show that for every ten students who entered higher education in the United States, only four students graduated in the first four years from the initially entered institution. Among the remaining six students, three exited during their first year of college, two exited during the second year and one left during the last two years. For the students who exited this was not the end of their college careers, for four of these students transferred and one returned to graduate from the original institution. The result was that among the 10 students who entered higher education, all but three graduated at some point in their future (Pantages & Creedon, 1978).

The national studies are very useful in providing basic information about college attrition, but the rates of attrition vary according to the type of institution. Attrition was higher at state-supported institutions than at private colleges. The highest graduation rates were found at technological institutions followed by liberal arts colleges, universities and then teacher colleges (Iffert, 1957; Summerskill, 1962; Trent & Ruyle, 1965). To effectively confront the problem of attrition each institution must examine its attrition rates. It should study the dimensions of the attrition phenomenon in the light of the characteristics of the institution, the students it serves, and the goals and priorities that the institution seeks to fulfill within the community.

At Indiana University's Bloomington campus it was found that of ten freshmen who enrolled in Fall 1974, three had exited from the University's System by the beginning of the Fall 1976 semester. These students represent a quantifiable loss in institutional investment of time, energy and dollars expended in the recruitment, teaching, advising, record maintenance, housing and other efforts to facilitate student growth. The graduate reflects the institution's effectiveness while the nongraduate erodes institutional capacity and credibility.

In a more humanistic view, the student who drops out of higher education sustains loss in earnings potential and immediate out-of-pocket expenses. But even more profound is the fact that many students who do not complete their intended degree programs suffer psychological loss - feelings of failure and disappointment in themselves and among their family and friends. The student, the family, the institution and the community lose when a person who is capable of attaining a higher education does not succeed in achieving that goal.

The present study, designed to identify characteristics of dropouts, classified the students who exited Indiana University into two groups: the academic dropouts and the nonacademic dropouts. Examining the information available on the University's computer files, it was found that the majority of students who exited during the first year were academic dropouts. This group could be characterized as being predominantly male with a higher representation of Indiana residents and minorities. These students tended to be "late admits" to the University which may be related to the finding that their admission files were likely to be incomplete, e.g., no records of Scholastic Aptitude Test (SAT) scores and/or high school records; and information on race, home state and parent alumni status. Among the academic dropouts who provided admission information, their SAT scores were at the national average of college-bound students but substantially lower than their peers at I.U. They ranked in the top 45 percent of their high school graduation class but again they were significantly lower in rank and from smaller high schools than their peers at I.U.

The profile of the academic dropouts indicated that they were students who probably decided at a relatively "late date" to go to college and were not thorough in their completion of forms for admission. They tended to be marginal in their academic abilities at the time of admission and found little to no institutional support for their academic deficiencies.

For the first time in the Fall semester of 1978, Indiana University made a major commitment of institutional support to provide compensatory programs for the type of student who might become an academic dropout. By providing and ensuring the effective placement of marginal students in basic skills courses in reading, English composition and mathematics, the University may in the future reduce the number of students who in this study were classified as academic dropouts. However, there are indications that the academic dropout would be the type of student who, in addition, needs close monitoring and supervision to ensure proper follow through and completion of the curriculum during the first semester/year at I.U.B.

The University should continue to refine its admission procedures; simple or arbitrary cut-off scores on admission variables do not compare to the mathematical combination of high school schievement and a common aptitude measure (SAT) for ranking students. This method of ranking (predicted grade point averages) allows for a more effective identification and for an "early warning" system at the time of admission.

Besides the academic dropout, a second and larger group of students who had exited from I.U. by the Fall of 1976 were classified as nonacademic dropouts. The majority of these students left during their second year at I.U. These students were characterized as being predominantly female with a higher representation of out-of-state students. Their admission was only slightly later to the University than their peers who persisted but they tended not to provide SAT scores. The absence of SAT scores among the nonacademic dropouts may reflect the larger out-of-state enrollment in this group. In general, Ohio and Illinois institutions of higher education require scores from the American College Testing (ACT) Program which I.U. will accept instead of SAT scores.

At the time of admission to the University, the nonacademic dropouts differed from their peers who persisted at I.U. in only two areas: 1) they were from smaller high schools and 2) they were ranked marginally lower in their high school graduation class. Although the nonacademics were equal to their peers on the grades they received during their first semester at I.U., their total grades over the two year period had dropped and they were significantly lower than the persisters by the time they exited the University.

This drop in grades may reflect problems in the relationship of the student and the academic environment.

Why do their grades drop? What semester do the problems begin? Is there any way to establish an "early warning" system to identify the nonacademic dropout before he/she exits the University? Research is in process that may begin to answer some of these questions. To date, the University has made few formal efforts to retain or facilitate the return of the nonacademic dropout. Without programs specifically addressed to the nonacademic dropouts, the University will continue to lose in the first two years about two out of ten students who enter and "make the grades" at I.U.

The students who persisted at Indiana University into the third year have a very good chance of completing their four year program. They began their program at I.U. by applying early for admission and providing complete admission records. They came from larger high schools and by the end of the second year they had maintained higher cumulative grade point averages than their peers who had exited. To more effectively match the student with the institution and its resources, it is important to follow these "survivors" and determine the characteristics of the student who graduates from I.U., his/her patterns of attendance, points of crisis and degree of satisfaction with their programs.

Having provided a description of the three groups of students, the researchers then focused on the relationship of the data gathered at the time of admission to the academic success and persistence of students at I.U.B. When an applicant is accepted by the University for admission, it is with the expectation that the new student will academically succeed and persist to the completion of a degree at this institution. Traditionally, the University selects those students who are most likely to succeed based on their high school achievement and scores on a standard measure of academic aptitude. First semester grades of a new student at I.U. can be more accurately estimated with the systematic combination of relative rank in the high school graduation class and scores on the Scholastic Aptitude Test (SAT) than with a system that examines high school or SAT data alone. Based on high school achievement and SAT scores, the first semester grades received by female students were more predictable than the grades received by their male peers. It was found that the earlier a female was admitted to the University, the higher were her first semester grades. However, the earlier admission date was not significant in refining the estimation of how well males would do during their first semester. After a student's high school achievement, SAT scores, and date of admission for females only, no other admission information (residency status, parent's alumni status, size of high school graduation class and race) increased the accuracy of estimating first semester grades at I.U.

A student's high school achievement, residence status (in-state vs. out-of-state) and the number of months between admission and matriculation were significant in estimating the cumulative hours of credit a student would complete

during the first two years at I.U. In addition, higher verbal skills as reflected in the SAT score were related to the persistence of females at I.U. As with Peng & Fetters' (1978) study of the data from the National Longitudinal Study of the High School Class of 1972, white males were more likely to withdraw from I.U. than the minority males who entered. When two males were equal on relative high school rank, residence status and date of admission, the minority male averaged 10.3 credit hours more than his peer. Several factors may account for this. In general a high proportion of minority students qualify for financial aid to attend the University. For a student to receive full financial benefits, he/she must maintain a full class load (12 or more hours) each semester. In addition, the eighteen to twenty-four year old minority male represents the least employable group in the U.S. The paucity of employment opportunities may have a major impact on the minority male's decision to continue enrollment during the two year period, i.e., he is less likely to become a dropout. These employment problems may also encourage minority males to attend summer sessions at the University, thus earning additional credit hours.

With the information available at the time of admission, students' academic success can be more accurately estimated than their persistence. However, after the first semester grades are received, a student's persistence is more predictable. This is most notable for males; how long they will persist is more accurately estimated than their academic success during the first semester. If males "make the grades," they are more likely to persist than females. For females, their academic success is estimated better than their persistence; grades are not as significant in the persistence at I.U. for females as for males.

Attrition/Persistence is a phenomenon associated with the student, retention is a phenomenon associated with the institution. An institution cannot force a student to persist. However, the institution can create an environment that will enhance the likelihood that students will persist. According to Warrington (1979) approximately 2.3 new students must be recruited to replace one dropout. This figure emphasizes the significance of the retention of students to the vitality of an institution. In the 1980s the number of students recruited at I.U.B. will decline. The better the institution understands the dynamics of the enrollment phenomenon, the more effective it will be in developing programs to retain students and facilitate the obtaining of the goal of a college education for each student who enters Indiana University.

Technical Appendix

Because of the extent of missing data encountered in this study and the identified relationship of missing data to success and persistence at I.U., an additional search of student records for the missing information was proposed. However, the estimated number of students who had missing data on one or more variables of interest on the Bureau's file was felt to be too large a group. Thus, a stratified random sample of 1000 cases was drawn from the original population; the stratification was on enrollment status.

For students in the sample of 1000 cases a thorough search was made for all missing information. In a check for missing data, it was found that 22 cases (14 males and 8 females) were admitted, enrolled and withdrew before the end of their first semester at I.U. (Fall 1974). An examination of the computer files for the remaining 978 cases resulted in complete information on all variables of interest for 409 (89%) males and 492 (95%) females.

The two criteria of interest in this study were first semester grades (GPA174) and cumulative hours (CUMHRS) of credit at I.U. in a two academic year period. The measures on the admission file that were hypothesized to be related to the criteria were 1) date of admission, 2) race, 3) parent alumni status, 4) residence status, 5) SATV, 6) SATM, 7) relative rank in high school and 8) size of high school. Because of the assumptions of multiple regression models the first three variables were recoded. Date of admission was recoded from month/year to the number of months between admission to the University and the initial semester/month of matriculation. Early admits had high values and late admits had lower values on the variable "admit date" or addate.

Within the entering freshman class at I.U.B. 4 to 5 percent were minorities. Because of the small numbers of subgroup minorities, race was recoded into two categories: Caucasian/Majority and non-Caucasian/Minority.

The 8 independent variables entered into the regression were:

Variable Name	Code
ADDATE	0 to 21
RACE	1 Caucasian/Majority 0 non-Caucasian/Minority
INxOUT	1 Indiana resident 0 out-of-state
PARAL	1 Alumni 0 non-Alumni
SATV SATM	200 to 800
Relrank	0 to 100*
HSSize	16 to 1600

*The smaller the number, the better the student. For example, a relrank of 5 indicates that the student is in the top 5 percent of his/her graduation class.

Because of the small number of cases in some cells of the dicotomous variables which resulted in empty cells in interactions effects, no interactions were included in the regression model.

There are two methods for obtaining the correlation used in the regression analyses: 1) use only cases that have data on all measures (listwise inclusion) or 2) compute the simple correlation on each pair of measures using all the available data on the two measures (pairwise inclusion). The continuing evidence of missing data after the conclusion of an extensive search and the indication of a relationship between missing data and enrollment status (specifically male ADs) led the researchers to use the pairwise inclusion of data in the regression analyses. Since the research question focused on degree of relationship not on an applied prediction, the pairwise solution was acceptable. All analyses were performed using SPSS multiple regression program with stepwise inclusion of the 8 or 9 independent measures.

For Tables 5-12, B's and the standard error of prediction (SE) correspond to those for the 'step' associated with the last significant variable, i.e., if four variables were significant, "STEP 4" B's and SE were reported. Each B can be interpreted as the units on the associated variable that corresponds to one unit of change on the criterion when preceding significant measures are held constant. If you have any questions or comments regarding the methodology, please contact Dr. S. Leellen Brigman, Bureau of Evaluative Studies and Testing, Phone: 337-1522 or 337-1595.

References

Chase, C.I., Dalton, S.L., Johnson, J.J. & Anastasiow, M.A. Persistence and conditions related to it: A persistent question. Indiana Studies in Prediction, 1976, 32.

Chickering, A.W. & Hannah, W. The process of withdrawal. Liberal Education, 1969, 55, 551-558.

Cope, R.G. & Hannah, W. Revolving College Doors: The causes and consequences of dropping out, stopping out, and transferring. New York: John Wiley & Sons, 1975.

Eckland, B.K. College dropouts who came back. Harvard Educational Review, 1964, 34, 402-420.

Fetters, W.B. Withdrawal from Institutions of Higher Education: An appraisal with longitudinal data involving diverse institutions. Washington, DC: National Center for Education Statistics, 1977.

Iffert, R.E. Retention and Withdrawal of College Students (Bulletin 1958, #1). Washington, DC: U.S. Government Printing Office, 1957.

Panos, R.J. & Astin, A.W. Attrition among college students. American Educational Research Journal, 1968, 5, 57-72.

Pantages, T.J. & Creedon, C.F. Studies of College Attrition: 1950-1975. Review of Educational Research, 1978, 48, 49-101.

Peng, S.S. & Fetters, W.B. Variables involved in withdrawal during the first two years of college: Preliminary findings from the National Longitudinal Study of the High School Class of 1972. American Educational Research Journal, 1978, 15, 361-372.

Statistical Abstracts of the United States. Washington, DC: U.S. Department of Commerce, 1974.

Summerskill, J. Dropouts from college. In N. Sanford (Ed.), The American College. New York: Wiley, 1962.

Trent, J. & Ruyle, J. Variations, flow and patterns of college attendance. College & University, 1965, 41, 61-76.

Warrington, W.G. Educational measurement needs of higher education in the eighties. A symposium presentation at the meeting of the National Council on Measurement in Education, San Francisco, 1979.